Status of CAS global ionospheric maps after the maximum of solar cycle 24

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As a new Ionosphere Associate Analysis Center (IAAC) of the International GNSS Services (IGS), Chinese Academy of Sciences (CAS) started the routine computation of rapid and final global ionospheric maps (GIMs) since 2015. The method for the generation of CAS rapid and final GIMs and recent updates are presented. The quality of CAS GIMs is assessed during a four-year period (2015-2018) after the maximum of solar cycle 24. To perform an independent and fair assessment, Jason-2 and -3 vertical total electron contents (VTEC) and GPS differential Slant TECs (dSTEC) computed from 55 multi-GNSS experimental (MGEX) stations of the IGS are employed as references. During the test period, JPL GIMs present significantly positive biases with respect to (w.r.t.) Jason VTEC and GPS dSTEC. UPC rapid GIM UQRG exhibits the best performance in both Jason VTEC and GPS dSTEC assessments. CAS GIMs show compatible performance w.r.t. the first four IAACs of the IGS. The inferior performance of all GIMs in equatorial regions and high latitudes of the southern hemisphere is found as expected. The consideration of generating multi-layer or three-dimensional ionosphere maps is emphasized to mitigate the inadequacy of single-layer assumption in the presence of pronounced latitudinal gradients. The inclusion of ionospheric observations from the new GNSS constellations and other space- or ground-based observation techniques is also suggested for the future GIM computation as of the sparse coverage of GPS/GLONASS stations in the southern hemisphere.